SYMONS'S

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OUR CLIMATOLOGICAL TABLES.

AT the commencement of a new volume, it is well to look back at the previous one, and in so doing it occurred to us that it would be well to bring prominently before our readers the unique features of our Climatological Tables, fourteen of which have now appeared in these pages.

The special features are three—(1) wide distribution; (2) simultaneity; (3) uniformity.

As regards their distribution, we have thought it might be convenient to prepare a map, showing distinctly the sites of the stations, and nothing could give a clearer idea of the distribution than that afforded by the map. We have marked a station in British Columbia, although at present we are not sure of its *precise* locality, inasmuch as we have left the selection of the station to the Director of the Canadian Meteorological system, Mr. Carpmael, of Toronto.

The simultaneity of the returns renders it possible to determine approximately whether hot periods and cold periods prevail over the whole globe or only in small districts, and whether excessive heat or cold in one part is usually compensated by the prevalence of the opposite extreme in another.

As to uniformity, our tables go as near to absolute identity as possible; we give identical data from each station, but obviously the conditions under which those data are observed vary—*e.g.*, Min. on grass at Madras or Bombay must be a difficult observation to make when weeks of scorching sun have withered every blade.

We feel sure that our readers will join us in thanking the distinguished men who furnish the returns, for their continued and indispensable assistance.

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, SEPT., 1882.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Absolute. Maximum. Date.	Absolute. Minimum. Temp.	Absolute. Minimum. Date.	Average. Max.	Average. Min.	Average. Dew Point.	Average. Humidity.	Absolute. Max. in Sun.	Absolute. Min. on Grass.	TotalRain. Depth.	TotalRain. Days.	Aver. Cloud.
	°		°		°	°	°	0–100	°	°	inches		
England, London	70·6	3	37·8	15	64·7	47·3	48·1	78	125·2	34·7	2·39	9	6·0
Cape of Good Hope	86·8	19	33·8	1	69·6	47·7	50·2	76	...	...	2·13	9	4·2
Mauritius	78·2	24	58·4	30	75·0	66·5	60·4	71	...	...	2·58	17	6·4
Calcutta	92·2	26	74·2	25	87·5	77·2	77·7	87	157·5	71·7	10·50	16	6·6
Madras	...	...	...	...	...	...	...	...	...	...	...	...	...
Bombay	86·8	30	73·7	10	84·0	76.0	75·8	86	148·6	70·1	10·08	17	7·5
Ceylon	87·2	11*	74·8	30	86·1	78·0	72·0	72	151·0	71·0	2·14	11	6·9
Melbourne	78·9	23	34·1	15	63·4	46·3	41·8	64	141·2	28·0	1·19	15	6·3
Adelaide	91·0	23	39·4	9	66·4	48·0	45·3	64	160·5	35·8	·70	15	6·4
Wellington	62·5	24	37·0	16	58·3	47·1	...	...	126·0	33·0	3·00	11	...
Auckland	67·3	30	44·1	24	61·7	49·1	47·0	74	131·2	37·8	2·68	18	7·8
Falkland Isles	50·8	22	30·3	21	43·1	35·5	37·3	91	107·0	24·2	1·70	17	8·4
Jamaica	90·8	30	72·6	25	88·0	74·2	73·4	80	...	67·2	3·68	...	6·5
Barbados	85·0	var.	71·0	5	83·0	74·0	73·1	78	151·0	70·0	7·05	15	5·0
Toronto	88·3	18	43·1	24	69·9	53·1	53·1	70	142·0	36·0	2·09	8	5·1
New Brunswick,S.John	82·0	3	44·0	28	67·1	53·1	52·5	87	...	...	1·89	4	6·6
Cape Breton, Sydney	76·5	1	39·5	14	64·9	50·4	53·2	86	...	...	7·87	12	6·9
Manitoba, Winnipeg	80·7	1	24·6	20	68·5	42·7	48·8	77	134·0	...	·79	5	3·9
British Columbia	...	...	...	...	...	...	...	...	...	...	...	...	...

* And 26.

REMARKS, SEPTEMBER, 1882.

Mauritius.—Rainfall 1·08 in. above the average; mean temp. 0°·5 above it; mean pressure, 30·175 in.; mean hourly velocity of wind 12·4 miles, extremes 31·6 miles and 1·7 miles; prevailing direction E.S.E. to E by S. C. MELDRUM, F.R.S.

Ceylon.—Lightning was seen on six occasions. J. STODDART.

Melbourne.—Mean temp. 1°·1 above the average of 24 years; temp. of dew point 1°·9 below it; mean pressure slightly, and rainfall considerably below the average, prevailing direction of wind N.; strong breezes occurring on eleven days; hot wind on the 23rd, heavy squalls on four days, and strong Northerly gale on 29th, heavy dews on three days, hoar frost on 15th, H on 6th and 17th, TSS on 17th and 29th. R. L. J. ELLERY, F.R.S.

Adelaide.—Mean pressure 30·063 in. Mean temp. 57°·2, corresponding exactly with that of the previous 25 years, but the rainfall was remarkably light, and the total since the commencement of the year is 4·48 in. below the mean of 43 years; this scarcity of R has been general throughout the Colony. C. TODD.

Wellington.—Generally stormy weather throughout the month, with prevailing N.W. wind; strong winds on eleven days; total rainfall small, but some heavy showers; T on 25th and 26th, H on 9th, and 23rd. R. B. GORE.

Auckland.—Weather variable, occasionally very fine; very stormy from 22nd to 28th, hailshowers on 24th and 25th, with very strong wind S.W. to W.; TS with heavy R (1·16 in.) on 26th, mist on 6th and 9th. E. B. DICKSON.

BARBADOS.—Mean pressure below the average; mean temp. (74°·7) same as the average; average velocity of wind 7·9 miles per hour, extremes 21·6 miles and 3·5 miles, rainfall 17 per cent. below the average, and evaporation 22 per cent. above it. Five days were overcast; TSS on 5th, 11th, and 23rd. R. BOWIE WALCOTT.

CAPE BRETON.—On 12th 3·45 in. of R fell. C. CARPMAEL.

A PALACE OF ICE.

WHILE the climate of England is oscillating between the close moisture of May, the bitter north-east winds of March, and the sleet and fog of November and December, Canada is rejoicing in the steady cold but bright and dry weather, upon the recurrence of which every one in the Colony reckons, and reckons not in vain. Winter there is a source of great profit and of keen enjoyment. Without the regular frosts and dry snows with which the country is visited, half the work of the farm and of conveying the produce of the forests and the farm to market, would have to be left undone; and while the agriculturist and the lumberer look forward to the advent of a steady "cold spell"—to say nothing of the opportunity that is afforded of laying up a store of ice for summer use—the people generally are not slow to avail themselves of the pleasure of sleighing, skating, and tobogganing. This year the citizens of Montreal have inaugurated a new institution in the shape of a magnificent "Crystal Palace," which has been erected in Dominion Square in that city. Instead of glass and iron, ice is the material of which this building is constructed Slabs of ice from the St. Lawrence, 40 inches high and from 14 to 20 inches in breadth and height, are the "bricks"; and these crystal blocks, piled on one another, are cemented together by a spray of water poured over them, which froze as it fell, and bound the whole together in a homogeneous mass. Of such material has a huge transparent palace been built, measuring nearly 100 feet square in the interior, with walls 25 feet high, and with towers 15 feet square and 30 feet in height; while from the centre rises a massive tower 32 feet square and 100 feet high. The roof is constructed of rafters of wood, upon which were spread cedar branches; these, again, being cemented together, like the walls of the structure, by a spray of water, which froze them into a solid mass, with long icicles depending from the roof in most picturesque confusion. When the bright sun falls upon this glitter ing palace with its frosted roof, the effect is indescribably beautiful; while at night, illuminated with thousands of electric lights within and without, the spectacle is, if possible, of even greater brilliancy.—*The Colonies and India.*

[This is not a new idea. Among the earliest recorded architectural attempts with ice as the material, were those of Lieutenant de Meynerts, at Lubeck, who having carved a lion about 7 feet long, surrounded it by a bastion mounted with five cannons, a soldier, and a sentry box, all formed out of ice. But M. le Chambellan Alexey Danielowitsch Tatischtschew, of St. Petersburgh, at the commencement of 1740, proceded much further, and at the cost of the Empress Anne, constructed an elaborate ice palace consisting of several rooms, even the furniture of which was made of ice. Perhaps the most remarkable fact, was the making and firing of ice cannons. These cannons were modelled from the ordinary service cannons of

which the charge was 3-lbs. of gunpowder—these ice ones were loaded with ¼-lb., and a bullet thrown by one of them pierced a plank 2 inches thick at a distance of 50 paces—as this appears a rather wonderful story, we finish this note by quoting Krafft's* arguments upon the subject:—

"Nous aprenons encore, qu'il est possible de tourner la glace au tour, de la percer, de la tailler, de la peindre ou enduire avec des couleurs, de la mettre en feu aprés l'avoir frotée de naphte, et enfin de s'en servir à tirer, sans qu'il soit besoin comme quelques uns l'avoient présumé, de garnir de tole le dedans du Canon. L'entreprise et l'execution d'un dessein si rare, nous a convaincu de la vérité de toutes ces choses, dont la plû-part ont pourtant été traitées de fictions par quelques personnes en Allemagne. Mais cette incredulité n'a rien qui nous surprenne. Je dirai plus, c'est que je suis assuré que plus avant la renommée de notre édifice de glace se répandra dans les païs Méridionaux, et plus la vérité en paroitra incroïable. On ne peut nier que la poudre à Canon n'ait une vertu fracassante, si j'ose me servir de ce terme; c'est par cette raison qu'il a semblé incroïable à quelques personnes, qu'on ait pû tirer avec nos Canons de glace, sans qu'ils se soient brisés en mille piéces. Mais je prie les incrédules de considérer, que cette vertu qu'a la poudre de fracasser, ne peut opérer que là où elle trouve le moins de résistence. Or si la glace dont est fait la Canon, est assés solide pour faire plus de résistence à la poudre, que n'en font le boulet qu'on a fait couler dans l'ame de la piéce, et le bouchon dont on ne peut se passer en la chargeant; qui ne voit que la vertu de la poudre opére necessairement sur ces derniers, qui sont les parties qui lui résistent le moins, qu'elle s'y fait jour, et laisse la glace en son entier?

* * * * * * *

"Je ne m' arrêterai pas davantage à rêpondre aux objections qui nous ont été faites. Il me sufit que plusieurs miliers de personnes ont été témoins oculaires durant un long tems de la vérité de tout ce que j'ai raporté jusqu'ici de cette maison de glace."]

THE METEOROLOGICAL SOCIETY.

THE Annual General Meeting of this Society was held on Wednesday, the 17th ult, at the Institution of Civil Engineers, Mr. J. K. Laughton, M.A., F.R.A.S., President, in the chair.

The Secretary read the Report of the Council, which showed that the total number of Fellows was 571; 47 new Fellows having been elected during the year.

The President then delivered his address. He referred briefly to the great importance of the uniform series of observations now taken under the auspices of the Society, and proceeded to speak at greater length of certain other points in which the society might, by its concerted action, further the interests of meteorological science. The first of these was anemometry, which is at present in a condition far from satisfactory. We know nothing positively either as to the pressure

* Description et Représentation exacte de la Maison de Glace construite a St. Petersbourg, au Mois de Janvier, 1740, par. Prof. G. W. Krafft, 4to. St. Petersbourg, 1741.

or the velocity of the wind; there is no exact standard instrument; and observations, whatever may be their absolute value, are not comparable one with the other. He thought that the Society might properly interfere, so far as to regulate the wide diversity amongst the instruments now used, in order that when the proper time came, and it was known what anemometer could be trusted, the older observations might be reduced. The movement of air in the upper regions of the atmosphere is not measurable by any existing method, but experiments have been made, at the suggestion of the Meteorological Council, in which the drift of the smoke-cloud of a bursting shell may be observed and measured. The observations of the barometer taken at elevated stations in the United States seem to throw considerable doubt on the received formulæ for the reduction of barometric readings to sea-level, and for the calculation of heights. When the observations extend over a long period, and are regularly taken under all conditions of weather, then no doubt the height of a mountain can be calculated with a fair approach to accuracy; but isolated observations, subject to the fluctuations of the different readings are extremely wild in their results. In the same way, the reduction of the barometer to sea-level is complicated by many discrepancies which arise between observations at the upper and lower stations, which have hitherto been ignored. It is impossible to say how far they affect the isobars on which our daily weather charts are based; but it seems probable that they are at least one additional source of error and of difficulty. It is much to be wished that systematic and continuous observations at high-level stations could be taken, not only on the top of Ben Nevis, but on the top of some others of the highest peaks in different parts of the country. In this way alone, can these difficulties of reduction be cleared away.

The following gentlemen were elected the Officers and Council for the ensuing year:—

President.—John Knox Laughton, M.A., F.R.A.S., F.R.G.S.

Vice-Presidents.—Edmund Douglas Archibald, M.A.; Rogers Field, B.A., M.Inst.C.E.; Baldwin Latham, M.Inst.C.E., F.G.S.; William Marcet, M.D. F.R.S., F.C.S.

Treasurer.—Henry Perigal, F.R.A.S.

Trustees.—Hon. Francis Albert Rollo Russell, M.A.; Stephen William Silver, F.R.G.S.

Secretaries.—George James Symons, F.R.S.; John William Tripe, M.D., M.R.C.P.Ed.

Foreign Secretary.—Robert Henry Scott, M.A., F.R.S., F.G.S.

Council.—Hon. Ralph Abercromby; William Morris Beaufort, F.R.A.S.; F.R.G.S.; John Sanford Dyason, F.R.G.S.; Henry Storks Eaton, M.A.; William Ellis, F.R.A.S.; Joseph Henry Gilbert, Ph.D., F.R.S., F.C.S.; Charles Harding; Robert John Lecky, F.R.A.S.; Capt. John Pearse Maclear, R.N.; Edward Mawley, F.R.H.S.; George Mathews Whipple, B.Sc., F.R.A.S.; and Charles Theodore Williams, M.A., M.D., F.R.C.P.

THE RECENT FLOODS IN WESTERN EUROPE.

To the Editor of the Meteorological Magazine.

SIR,—With reference to the article in the January number of the *Meteorological Magazine*, I send herewith some data respecting rainfall :—

RAINFALL DEC. 24–JAN. 4.

	Salzburg.	St. Georgen near Salzburg	Ischl.	Schafberg.	Linz.	Krems.	Wien.
Altitude in feet :	1431	1847	1532	5827	886	752	666
DATE.	in.	in.	in.	in.	in.	in.	in.
December 24	·51 s	...	·91 s	2·01 s	...	·04 s	·04 s
,, 25	·47 sr	...	1·06 r	·59 s	·04 s	·04 s	...
,, 26	1·24 r	2·24 rs	2·84 r	3·11 sr	·35 s	·08 s	·39 rs
,, 27	·67 r	2·21 r	2·56 r	2·79 sr	·47 r	·12 r	·79 rs
,, 28	·06 r	1·50 r	·35 r	2 09 r	1·54 r	·83 r	·08 r
,, 29	...	·04	...	·08 r	·35 r	...	...
,, 30	·06 r	...	·16	...	...	...	...
,, 31	·61 r	·63 r	1·02 l, r	·63 s	·47 r	·04 r	·20 s
January 1	1·69 r	?	2·64 r	?	91 r	?	·59 r
,, 2	·15 r	·16 r	·51 r	?	·35 r	?	·39 r
,, 3	·33 r	·32 r	·51 r	?	?	?	·20 r
,, 4	·04 sr	·04 r	·04 r	?	?	?	·08 r
Totals	5·83	7·14 ?	12·60	11·30 ?	4·48 ?	1·15 ?	2·76

r = rain ; s = snow ; l = lightning.

The flooding was due to the melting of snow by the warm weather, as well as to abundant rainfall.

Raab lies on a branch of the Danube, and was flooded by it, and not by the little river of that name.—Yours truly,

J. HANN.

K.K. Central-Anstalt fiir Meteorologie und Erdmagnetismus, Hohe Warte bei Wien, Jan. 24.

To the Editor of the Meteorological Magazine.

SIR,—Allow me to send you some notices of facts, which plainly confirm your suggestions on the probable causes of the recent great floods (*Met. Mag.*, Jan. 1883, p. 182-3).

From December 4th to 26th there fell some snow every day in the Alps, the whole amount of which reached on the St. Gotthard 5·20^{m} (17 ft.),or about 520^{mm} (20·47 in.) if melted—the thermometer never rising to freezing point. On December 25th large quantities of fresh snow came down ; 61^{cm} (2 ft.) at Davos; 90 ^{cm} (3 ft.) on the Gotthard. The next day's heavy south-westerly winds everywhere produced a considerable increase of temperature, as the following figures will show :—

Meteorological Station.	Altitude above Sea. Metres.	Feet.	Temperature Fhrt. at 1 p.m. Dec. 25.	Dec. 26.	Dec. 27.
Säntis	2440	8005	8·6	24·8	26·6
Gotthard	2100	6890	12·2	32·0	33·8
Davos	1560	5118	23·0	35·6	35·6
Trogen (Appenzell).	892	2927	32·0	44·6	46·4
Basle	278	912	33·8	50·0	55·4

Snow and rain still continued in the Alps.

At Basle, the Rhine rose from $2^{m}\cdot90$ (9 ft. 6 in.) on the 26th, at 4 p.m. to $4^{m}\cdot82$ (15 ft. 10 in.) on the 27th at 3 p.m., and reached its highest level $5^{m}\cdot62$ (18 ft. 5 in.) on the 28th at 10 a.m., inundating its shore. The quantity of water passing each second under the bridge was at least 4,500 tons, *i.e.*, four or five times as much as usual. The velocity I measured was nearly 3^{m} (10 ft.) per second. (Nearly 7 miles an hour).

The same cause, rapid melting of snow, swelled to a dreadful height, all the rivers running down from the Jura and Black Forest.

Similar circumstances are met with in the Bavarian Alps and the mountain ranges of Germany, the Rhön, Spessart, and others. But while in Switzerland, heavy rains were confined to the highlands; in Germany, the lower countries also received a large amount of water, somewhat exceeding double the normal quantity. The report of the Central Office at Munich contains the following instances with more than 100^{mm} rainfall.

Station.	Total Rainfall during Dec. 1882. mm.	in.
Aschaffenburg	117·9	4·64
Kissingen	104·3	4·10
Passau	143·5	5·65
Nürnberg	165·7	6·53
Cham	119·8	4·72
Weiden	114·0	4·49
Ansbach	111·3	4·38
Augsburg	136·2	5·36
Traunstein	133·5	5·25
Kempten	194·9	7·67
Berchtesgaden	180·6	7·12
Rabenstein	261·0	10·28
Bad Kreuth	317·6	12·52

Hence it was the interference of heavy rains and melting snow which produced the immense floods in the lower valley of the Rhine, while in Switzerland the floods only arising from suddenly-melting snow were not so excessive, and had soon passed.—I have the honor, &c.,

DR. A. RIGGENTACH,

Assistant for Meteorology and Astronomy at the Bernoullianum at Basle.

Basle, Feb. 10*th*, 1883.

SOLAR HALOS.

[As the writer of the following note lives some thousands of miles away, we have not had time to obtain his permission to print the following portion of a private letter, but it appears to us undesirable that such an interesting statement should be buried, on account of a question of mere etiquette.]—Ed.

I was very much surprised at the statement of the average number of solar and lunar halos in the paper by Mr. Backhouse, *Met. Mag.*, Dec., 1882. With us the lunar is far more common than the solar halo, and neither is so frequent as with you. As a matter of curiosity, I have just looked over my records, and find that in the last three years I have noted six solar and twenty-six lunar halos. In nine years there have been fourteen solar halos. It is a somewhat singular fact, in the summer months none occurred of either kind.

I suppose the difference between the two countries in the frequency of this phenomenon is caused by the greater humidity of the English climate; we have more sunshine and a drier atmosphere.—Yours truly,

HENRY D. A. WARD.

Middletown, Connecticut, U.S.A.

SUN SPOT PERIODICITY.

To the Editor of the Meteorological Magazine.

Sir,—In answer to the question on sun spot periodicity (*Met. Mag.*, Jan., 1883, p. 192) allow me to add—

(1). That the researches of Prof. Wolf are published in the last number of his journal "*Astronomisch Mittheilungen*," No. 57, p. 228, 1882, and will also be found, I suppose, in the *Vierteljahrschrift der naturforschenden Gesellschaft zu Zurich.*

(2). One of the periods is entirely new (that of ten years), while the other, of eleven years four months, closely agrees with the previous one of eleven and one-ninth years.

(3). The numbers given by Prof. Wolf may not be altered by more than a month.

(4). The general principle of the investigation may be shortly explained as follows:—Suppose the whole series of 1,440 monthly relative numbers (Relativzahlen) of sun spots to be graphically represented, time as abscissæ, relative numbers as ordinates, the result will be a kind of wave line, part being above, and part below, the straight line (the axis), representing the mean value of sun spot frequency, viz., 47·8. Then cut the whole wave-line into pieces, each embracing exactly ten years for instance; superpose all these pieces, so that the axes of all coincide, and draw the resulting wave-line by adding all overlaying ordinates. Now, if the ten years don't correspond with a period of sun spots, the overlaying ordinates will be partly positive, partly negative, and will, therefore, destroy themselves more or less in the resulting curve. If, on the contrary, the ten years represents a real period, the resulting curve will in the

mean, on both sides, be more distant from the axis than any other curve resulting from pieces embracing nine years eight months, ten years two months, or others. Prof. Wolf has tried all periods, from nine years six months, nine years eight months, and so on, to twelve years six months. The curves for ten years and for eleven years four months showing a clearly-pronounced maximum of mean ordinates, correspond, of course, with real periods of sun spots.—I have the honour to be, Sir, your obedient servant,

DR. A. RIGGENTACH,
Assistant for Meteorology and Astronomy at the Bernoullianum at Basle.

Basle, Feb. 10, 1883.

RAINFALL AT KIMBERLEY, SOUTH AFRICA.

GAUGE 5IN., BY NEGRETTI & ZAMBRA.

MONTH.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.
	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	7·11	2·57	1·50	·66	·50	2·44	5·32	5·95	1·60
February	8·98	3·62	4·00	3·88	2·93	2·78	1·34	6·05	1·30
March	3·00	2·25	2·25	1·41	·81	4·45	·60	8·10	3·80
April.....	·53	·86	?	·05	·41	·23	·30	1·40	1·08
May	?	1·75	?	·93	·71	·53	·23	1·73	1·27
June	?	·22	Snow	·00	·00	1·29	·02	·13	·03
July	S ·91	S 1·30	?	·66	·63	·61	·00	·00	·81
August.....	?	·05	?	·35	1·10	·30	·00	S ·84	·75
September ...	?	·00	?	·87	·00	5·95	·00	·00	1·26
October.....	?	1·13	?	1·24	·16	·00	2·10	·43	·47
November ...	?	1·64	?	1·35	1·15	·27	1·50	5·03	·80
December.....	?	1·87	?	2·18	·94	·53	4·02	·64	1·60
Total.....	?	17·26	?	13·58	9·34	19·38	15·43	30·30	14·77

NOTE.—Snow fell July, 1874–75, June, 1876, August, 1881.

HEAVIEST RAINFALLS.

Feb. 27th, 1879, 2·20 fell in less than two hours.
Sept. 22nd, 1879, 1·63 fell in about three hours.
Night, Sept. 27th, 1879, 2·14 fell in about five hours.
December 10th, 1880, 1·00 fell in two hours.
Jan. 27th, 1881, 2·17 fell in about two hours.
Feb. 2nd, 1881, 1·30 fell in one hour.
Feb. 6th, 1881, 0·82 fell in half-an-hour.
Feb. 25th to 27th, 1881, 3·32 fell in three days.
Night of March 3rd, 1881, 1·44 fell in ten hours.
March 9th to 12th, 1881, 4·98 fell in four days.
Nov. 2nd, 1881, 2·80 fell in about three hours and a half; the bulk fell in about one hour.
Night of March 12th, 1882, 1·90 fell in eight hours.

F. W. MATTHEWS.

Kimberley, January 12, 1883.

THE RECENT MILD WEATHER.

To the Editor of the Meteorological Magazine.

SIR,—With reference to Mr. Gwilliam's letter in the *Meteorological Magazine* for January, on the recent mild weather, I enclose my observations for the same week (that ending January 1st, 1883). My thermometers are verified, and are in a Stevenson's screen.

DATE.	Bar.	Max.	Min.	Mean.	Min. on grass.	Rainfall.
Dec. 26th, 1882..	29·42	51°	37°	44°·0	36°	·22
,, 27th	29·45	55°	49°	52°·0	45°	·23
,, 28th	29·48	55°	49°	52°·0	47°	·01
,, 29th	29·50	54°	40°	47°·0	35°	—
,, 30th	29·70	44°	38°	41°·0	38°	·52
,, 31st	29·90	54°	42°	48°·0	42°	·27
Jan. 1st, 1883...	29·70	55°	44°	49°·5	41°	·08
Mean	29·59	52°·6	42°·7	47°·6	40°·6	Total 1·33

Wind :—Dec. 26th, N.W.; 27th, W.; 28th, W.; 29th, W.; 30th, W.; 31st, S.E.; Jan. 1st, S.W.—Yours faithfully,

FRED. COVENTRY.

Ketton Hall, Stamford, January 18, 1883.

[The mean temperature during the above week was, therefore, only 47½ degrees at Ketton (Rutlandshire), against 52 degrees at Bayswater and Greenwich.—ED]

EXTRACT FROM LOG OF VOYAGE TO WEST INDIES FROM ENGLAND.

Days.	Lat.	Long.	Rain. inches.	Winds.	Evaporation. inches.	Locality.
	° ′	° ′				
Oct. 28...	25 53	39 14	·016	E.N.E.	·262	Atlantic.
,, 29...	23 53	42 37	...	E.N.E.	·308	do.
,, 30...	22 4	46 4	·060	E.	·275	do.
,, 31...	20 7	49 10	...	E.S.E.	·280	do.
Nov. 1...	18 19	52 20	...	E.S.E.	·300	do.
,, 2...	16 12	55 24	...	E.S.E.	·275	do.
,, 3...	13 55	57 45	·012	S.E.	·263	do.
,, 4...	13 4	59 37	...	S.E.	·284	Barbadoes.
,, 5...	14 0	61 0	·020	S.E.	·262	St. Lucia.
,, 6...	14 0	61 0	·058	E.S.E.	·234	do.
,, 7...	14 0	61 0	·010	E.S.E.	·250	do.
,, 8...	13 13	61 13	·115	E.	·288	St. Vincent.
,, 9...	12 3	61 43	·436	E.	·105	Grenada.
,, 10...	10 39	61 23	·500	S. N.E.	·096	Trinidad.
,, 11...	10 39	61 23	...	S.E. N.E.	·158	do.
12..	10 40	63 15	·545	S.E. N.E.	·136	Margarita.
,, 13...	10 55	65 9	...	E.	·128	Tortuga.
,, 14...	10 37	66 56	·236	E.	·127	Caracas.
Total 19..			2·008		4·031	

Mean Rain per diem, 0·111 inches; Evaporation per diem, 0·223 inches; miles steamed per diem, 134.

The above extract from the log of a steamer trading to the Leeward Islands, West Indies, is forwarded for inspection, and may prove interesting to your readers, from containing a *comparison* between evaporation and rainfall at sea.

It may be pointed out that the total amount of *evaporation* was double that of the rainfall, as well as the average per diem, and that the evaporation in the *Atlantic Ocean* was double that in the Carribean Seas, which also will apply to the Windward and Leeward Islands affected. The course through the Atlantic was through the dry *Intra-tropical Belt*, which exhibited little rain, but considerably more fell in the Carribean Seas; after entering the *Equatorial Rain Belt*, under 12° N. Lat., it will be seen that as soon as the *heavy rain* began the amount of evaporation dropped off to nearly half. The *winds* were easterly throughout, in both seas, and were probably the usual winter-trade winds, which are dry and fresh.

The amounts of daily evaporation on board ship certainly appear *rather large*, and would require more observations to substantiate such results, but it should be kept in mind that the ship is constantly moving, and the winds constantly blowing day and night at sea, and that trade winds are drying winds and the sunshine is clear within the tropic lines.

W. J. BLACK, F.M.S.S.

2, George Square, Edinburgh.

[Would Surgeon-Major Black send a brief description of the apparatus employed?—ED.]

SOME WEATHER PROGNOSTICS.

To the Editor of the Meteorological Magazine.

SIR,—There are three sets of popular prognostics, which I find are applied by different people in very different ways, so that I venture to ask whether some of your readers may be able to throw some light on the question.

In the first place, we are familiar with the names of "goat's hair," and of "mare's tails," as applied to clouds. Now, are these identical, or, if not, what is the distinction between them?

In the second place, there is a kind of cloud called in different parts of the country "the hake-shaped cloud," "a salmon," or a "Noah's ark," which is supposed to indicate rain when it stretches east and west, but fine weather when it points north and south. How would you describe this cloud?

Lastly, there are what are called good and bad hours for clearing, that is to say, that if during a rainy day the sky breaks about 11 a.m. or 2 p.m., the improvement will not last, so that these are bad hours. If, on the contrary, the break occurs about noon, or 4 p.m., it is expected that the weather will clear permanently, and these are called good hours of clearing. These are the hours which

hold good in Scotland, but perhaps they vary in different parts of the country.

Allied to this, is the well-known saying—"Rain at seven, fair at eleven; rain at eight, fair late." Can any of your readers give me any information about the rain at seven, which would be specially valuable if they could give the dates on which they have observed the prognostic to hold good.

On all these sayings I would gladly receive information, either through your columns or otherwise. In the case of clouds, the roughest sketch would be more valuable than pages of written matter.—I am, &c., &c.,

RALPH ABERCROMBY.

21, Chapel Street, Belgrave Square, London, S. W.
Feb. 7, 1883.

A LOFTY OBSERVATORY.

REFERRING to the Weather Observatory established at the Government chinchona plantations, Jamaica, the *Jamaica Gleaner* says that the necessary arrangements have been made by Mr. Maxwell Hall. The Observatory is at the residence of Mr. Morris, Director of the Botanical Department, who has undertaken voluntarily to give it personal and daily attention, in addition to the discharge of his regular heavy official work. It is beyond question the highest Observatory in the British Empire, the elevation being 4,900 feet. The mean annual rainfall at this particular spot and elevation is put down at 136 in., and the mean annual temperature at 60° Fahrenheit. The instruments placed at this new observatory, whose readings will have a special importance, are a very fine standard barometer and two good ordinary thermometers, all carefully corrected, and working in harmony with the instruments in Kingston. Apart from the bearing which the readings will have upon questions connected with the selection of land for chinchona, much information of scientific and general interest will be gained from them. Mr. Morris's observations will appear in Mr. Hall's monthly meteorological report in the *Jamaica Gazette.*

SUPPLEMENTARY TABLE OF RAINFALL, JANUARY, 1883.

[For the Counties, Latitudes, and Longitudes of most of these Stations, see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
II.	Dorking, Abinger	2·44	XI.	Llanfrechfa Grange	6·78
,,	Margate, Birchington...	1·49	,,	Llandovery	5·98
,,	Littlehampton	2·78	,,	Solva	2·78
,,	St. Leonards	2·27	,,	Castle Malgwyn	7·12
,,	Hailsham	2·99	,,	Rhayader, Nantgwillt..	9·41
,,	I. of W., St. Lawrence.	2·47	,,	Carno, Tybritle	7·51
,,	Alton, Ashdell.....	3·76	,,	Corwen, Rhug	5·41
III.	Great Missenden.....	2·89	,,	Port Madoc	5·28
,,	Winslow, Addington ...	2·68	,,	I. of Man, Douglas	5·05
,,	Oxford, Magdalen Col...	2·29	XII.	Carsphairn	12·03
,,	Northampton	2·75	,,	Melrose, Abbey Gate...	3·37
,,	Cambridge, Beech Ho...	1·29	XIII.	N. Esk Res. [Penicuick]	3·45
IV.	Southend	1·11	XIV.	Ayr, Cassillis House ..	4·01
,,	Harlow, Sheering	1·57	,,	Glasgow, Queen's Park.	6·18
,,	Diss	1·65	XV.	Islay, Gruinart School..	5.17
,,	Swaffham	2·10	XVI.	St.Andrews,NewtonBk	3·92
,,	Hindringham	2·44	,,	Aberfeldy H.R.S.	6·68
V.	Salisbury, Alderbury...	2·62	,,	Dalnaspidal	7·97
,,	Warminster	3·17	XVII.	Keith H.R.S.	·58?
,,	Calne, Compton Bassett	3·03	XVIII.	Forres H.R.S.	1·26
,,	Beaminster Vicarage ...	5·13	,,	Strome Ferry H.R.S....	6·47
,,	Ashburton, Holne Vic..	9·78	,,	Lochbroom	4·67
,,	Torrington,LangtreeW.	4·55	,,	Tain, Springfield.....	1·70
,,	Lynmouth, Glenthorne.	6·02	,,	Loch Shiel, Glenaladale	10·65
,,	Probus Lamellyn.....	4·36	XIX.	Lairg H.R.S.	3·05
,,	Taunton, Fullands	2·91	,,	Forsinard H.R.S.	2·25
VI.	Bristol, Clifton	3·91	,,	Watten H.R.S.	2·18
,,	Ross	4·25	XX.	Fermoy, Glenville	8·19
,,	Wem, Sansaw Hall.....	3·36	,,	Tralee, Castlemorris ...	7·29
,,	Cheadle, The Heath Ho.	3·68	,,	Tipperary, Henry Sreet	5·68
,,	Worcester, Diglis Lock	3·27	,,	Newcastle West	6·50
,,	Coventry, Coundon	3·89	,,	Kilrush	...
VII.	Melton, Coston	2·31	,,	Corofin	8·08
,,	Ketton Hall [Stamford]	2·14	XXI.	Carlow, Browne's Hill..	5·06
,,	Horncastle, Bucknall ...	2·46	,,	Navan, Balrath	3·46
,,	Mansfield Market Place.	3·41	,,	Athlone, Twyford	5·95
VIII.	Macclesfield, The Park.	3·46	XXII.	Mullingar, Belvedere...	4·88
,,	Walton-on-the-Hill.....	3·77	,,	Clifden, Kylemore	8·47
,,	Lancaster South Road..	6·05	,,	Crossmolina, Enniscoe..	7·71
,,	Broughton-in-Furness ..	8·61	XXIII.	Carrick-on-Shannon ...	7·90
IX.	Wakefield, Stanley Vic.	2·67	,,	Dowra	7·47
,,	Ripon, Mickley	4·94	,,	Rockcorry.....	5·26
,,	Scarborough.....	1·47	,,	Warrenpoint	6·32
,,	EastLayton[Darlington]	3·58	,,	Newtownards	3·07
,,	Middleton, Mickleton ..	8·43	,,	Belfast, New Barnsley .	4·32
X.	Haltwhistle, Unthank..	3·94	,,	Bushmills	3·95
,,	Shap, Copy Hill	13·09	,,	Buncrana	5·0

JANUARY, 1883.

Div.		STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL. Total Fall.	Difference from average 1870–9	Greatest Fall in 24 hours. Dpth	Date.	Days on which ·01 or more fell.	TEMPERATURE. Max. Deg.	Date.	Min. Deg.	Date.	No. of Nights below 32°. In shade.	On grass.
			inches	inches.	in.								
I.	ENGLAND.	London (Camden Square) ...	2·07	— ·28	·34	29	21	55·3	1	28·8	24	4	15
II.		Maidstone (Hunton Court)...	1·52	— 1·05	·25	29	18	...	...	...	...	...	...
,,		Strathfield Turgiss	2·18	— ·37	·45	29	23	54·3	1	25·8	31	6	20
III.		Hitchin	1·91	— ·31	·28	15	20	52·0	1	25·0	23*e*	14	...
,,		Banbury	2·54	+ ·16	·42	29	21	54·0	1	25·5	31	12	...
IV.		Bury St. Edmunds (Culford)	2·00	+ ·16	·53	24	20	55·0	29	25·0	20*e*	17	..
,,		Norwich (Cossey)	1·88	+ ·18	·35	24	16	55·5	1	26·0	21	11	18
V.		Bridport	3·57	...	·50	25	19	...	..	...	...	...	...
,,		Barnstaple	3·60	— ·66	·47	14	18	57·0	2	31·0	7	...	..
,,		Bodmin	5·27	— 1·24	·80	10	25	56·0	17	32·0	16	2	9
VI.		Cirencester	3·79	+ ·41	·43	24	24	..	...	...	...	...	...
,,		ChurchStretton(Woolstaston)	3·79	+ ·36	·52	24	21	53·0	1	26·0	7, 8	11	18
,,		Tenbury (Orleton)	3·99	+ 1·00	·60	24	24	55·7	1	26·3	31	7	14
VII.		Leicester	2·26	...	·32	29	22	54·0	18	28·0	21	6	16
,,		Boston	2·04	+ ·32	·38	24	16	54·0	29	28·0	24	5	...
,,		Grimsby (Killingholme).....	2·32	+ ·56	·52	24	23	53·5	29	26·0	25	5	...
,,		Hesley Hall [Tickhill].....	2·86	...	·40	28	16	54·0	28	25·0	28	11	...
VIII.		Manchester (Ardwick).....	4·15	+ ·91	·92	29	17	53·0	1	28·0	8	6	...
IX.		Wetherby (Ribston Hall) ...	3·21	+ ·99	·46	15*a*	15	...	...	...	...	...	...
,,		Skipton (Arncliffe)	9·46	+ 2·53	2·11	28	21	51·0	1	19·0	30	10	...
X.		North Shields	1·53	— ·31	·36	25	17	54·0	1	25·5	31	12	14
,,		Borrowdale (Seathwaite).....	21·92	+ 3·17	3·13	24	25	51·5	1	23·0	9	6	...
XI.	WALES.	Cardiff (Ely).....	5·64	+ ·93	·99	24	22	...	...	...	...	...	...
,,		Haverfordwest	5·59	— ·68	1·00	24	16	54·0	10*c*	28·0	15	7	18
,,		Plinlimmon (Cwmsymlog) ...	5·01	...	·85	28	17	...	...	...	...	...	...
,,		Llandudno.....	2·53	— ·43	·51	28	18	54·0	1, 17	30·2	8	4	...
XII.	SCOTLAND.	Cargen [Dumfries]	7·54	+ 1·43	1·41	24	22	52·0	29	25·6	31	6	...
,,		Hawick	3·02	— ·20	·47	27	16	...	...	..	...	...	...
XIV.		Douglas Castle (Newmains)	5·72	+ ·28	·95	28	17	...	...	...	...	...	...
XV.		Lochgilphead (Kilmory).....	7·92	+ ·05	2·01	23	23	...	...	26·0	31	11	...
,,		Appin (Airds)	6·30	...	...	...	...	...	...	...	...	...	.
,,		Mull (Quinish).....	6·50	...	1·43	23	20	...	...	...	..	...	...
XVI.		Loch Leven Sluices	4·20	+ ·38	·70	29	18	...	...	...	...	...	...
,,		Arbroath	2·67	+ ·22	·65	14	14	47·0	1*d*	27·0	31	13	...
XVII.		Braemar	4·75	+ 1·97	1·10	24	19	47·0	17	11·0	31	18	28
,,		Aberdeen	2·82	...	·56	24	16	50·0	1	26·0	7	13	...
XVIII		Skye (Sligachan)	16·02	...	4·05	17	19	...	...	...	...	...	...
,,		Culloden	1·66	— ·11	...	...	...	49·5	17	25·8	31	12	29
XIX.		Dunrobin	2·07	...	·45	28	11	...	...	...	...	...	...
,,		Orkney (Sandwick)	3·09	— ·25	·54	28	20	48·1	17	30·8	4	1	10
XX.	IRELAND.	Cork (Blackrock)	9·72	+ 3·70	1·90	28	26	53·0	18	25·0	31	11	...
,,		Dromore Castle	7·94	...	·81	26	27	54·0	1	28 0	30	3	...
,,		Waterford (Brook Lodge) ...	5·90	...	·72	26	23	53·0	1	29·0	31	3	...
,,		Killaloe	8·40	...	1·04	28	23	55·0	1	26·0	31	10	...
XXI.		Portarlington	3·97	+ ·91	·63	28	26	55·5	25	26·0	9	9	...
,,		Dublin (Monkstown)	2·68	+ ·42	·68	24	20	55·7	1	30·4	7	2	9
XXII.		Ballinasloe	5·88	...	·66	17*b*	28	52·0	1	26·0	31	12	...
XIII.		Waringstown	3·84	+ ·43	·72	25	18	54·0	1	23·0	31	14	20
,,		Londonderry (Creggan Res.).	4·79	...	·76	23	23	...	...	...	...	...	...
,,		Omagh (Edenfel)	4·13	+ ·36	·94	23	23	53·0	1	28·0	18*f*	14	...

+ Shows that the fall was above the average; — that it was below it.

a And 28. *b* And 26. *c* And 12, 13, 14. *d* And 17, 19. *e* And 30. *f* And 25, 30.

METEOROLOGICAL NOTES ON JANUARY.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; T S for Thunderstorm; R for Rain; H for Hail; S for Snow.

ENGLAND.

STRATHFIELD TURGISS.—The land is yet unworked, wet and foul, and but little winter corn has been sown. The new year begins with disease among the flocks and herds; fluke in sheep is general, and swine fever prevails.

BANBURY.—A damp and cheerless month; latter part very stormy; mean temp. (40°·6) about 5° above the average; high wind on ten days. S on 24th and 26th; H on 30th.

CULFORD.—The weather throughout the month was very unsettled, and high winds very prevalent. The sudden changes of temp. have been very trying, causing much sickness.

BODMIN.—A singularly mild January; mean temp. 42°·5.

CIRENCESTER.—A mild and damp month.

WOOLSTASTON.—Latter part of the month very stormy, especially between the 23rd and 28th. Mean temp. 38°·3; S on 25th, 26th, and 29th.

TENBURY, ORLETON.—A very cloudy and damp month, with frequent fogs, and a rainfall much above the average; temp. very near the average of 20 years, but fluctuating; bar. very unsteady, and a rapid succession of strong gales of wind. Ground covered with S on 27th and 30th. The rivers Severn and Teme were full after the 24th, and several times flooded; clay lands perfectly saturated, and all farming operations suspended; very little wheat sown.

BOSTON.—A wet, dull, cold month, ground completely saturated, and all farming operations at a standstill; the latter part of the month was very stormy, but no damage was done in this neighbourhood. Although water is standing in all the low places, there have not been any great floods here. S on 24th, 27th and 30th.

GRIMSBY, KILLINGHOLME.—Weather very unsettled, but mild for the season; strong gales on the 25th, 26th, and 27th. The continuous wet is causing farmers much anxiety.

ARDWICK.—On the whole an unpleasant month; there was very little frost, but it was gloomy and wet, especially towards the end. On the 24th there commenced a series of severe storms, which lasted over four days, doing a great deal of damage.

ARNCLIFFE.—Violent storm on 26th, 27th, and 28th, and on the latter day the highest flood in the river ever remembered.

NORTH SHIELDS.—A cloudy month with a good deal of fog; very stormy on 26th with S.

WALES.

HAVERFORDWEST.—A month of great and sudden changes; commencement very mild and relaxing; at times very cold; again very stormy and wet, blowing sometimes with terrific violence. On 2nd, at noon, T, with very bright L; frosty from 3rd to 10th, on which night the darkness was intense, followed by a furious gale, with torrents of R, which lasted one hour, suddenly ceasing. Large lunar halo on 18th, followed by storm; again very stormy from the 25th to 29th, the wind blowing with hurricane violence, and R excessive. Altogether, one of the most stormy and squally Januarys recorded during the last thirty-five years; nights remarkable for the low temperatures on grass.

LLANDUDNO.—The month, though rather dull and showery, was mild; mean temp. slightly above the average, and rainfall slightly below it; only four nights of frost. Several heavy gales of wind, especially from the 25th to the 28th inclusive. Only 50·4 hours of bright sunshine.

SCOTLAND.

CARGEN.—Very dull throughout, and very stormy towards the end ; mean temp. 40°·0, 2°·0 above the average ; 49 hours sunshine, 15 hours below the average.

HAWICK.—An open month, and all agricultural operations have been pushed forward ; blackbird in full song on 24th ; snowdrop and aconite in bloom at the close. The 11th and 12th were both singularly dark days ; strong winds on 19th, 23rd, and 27th ; heavy snowstorm on 24th.

ABERDEEN.—Good seasonable weather throughout the month ; rainfall not much above the average. Auroræ seen on three nights ; prevailing winds S. to S.W.

SLIGACHAN.—The weather during the month was very favourable ; cattle and sheep doing well ; very fine from 6th to 11th.

CULLODEN.—The weather during the month was very severe, and work of every kind is much in arrear ; but little R fell between the 2nd and 17th, and the fall of S was inconsiderable.

SANDWICK.—Temp. above, and rainfall below the average ; the ground was covered with S on 26th and 27th ; some strong gales of wind occurred, and auroræ were seen on six nights.

IRELAND.

DROMORE CASTLE.—A month of perpetual R and storm ; heavy gale on the night of the 28th, L on 24th, S on 26th.

WATERFORD.—The month was remarkable for heavy gales, which often lasted for a considerable time, principally from S.W. Rainfall a good deal above the average ; primroses in bloom on 14th ; H on 14th and 24th ; very large lunar halo on 18th ; S on 25th and 26th.

KILLALOE.—The month was wild and wintry in the extreme, and the rainfall much above the average.

DUBLIN.—An open, rainy, stormy month. Mean temp. 42°·7, about 2°·0 above the average of 18 years ; the rainfall and number of wet days were also both above the average ; mean pressure, 29·729 ; humidity, 86 ; and amount of cloud, 6·0 ; prevailing winds S.E., S.W., and W.

BALLINASLOE.—The month was very wet and stormy throughout, and there were constant floods. The river rose 3 ft. above its ordinary summer level; no attempt at agriculture possible.

LONDONDERRY, CREGGAN RES.—Latter part of the month rather stormy ; S fell occasionally from 24th to 26th ; on 27th a heavy gale passed over this district from the W., and there were other gales on four occasions.

OMAGH, EDENFEL.—The first week was remarkably mild and fine, the mean temp. of New Year's Day being 11° above the average of twenty years. The remainder of the month, however, was signalized by almost continuous R, and storms, culminating during the last week in a violent gale, with S and sleet squalls.